MODIS Science Team Semi-Annual Report

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a) Task Objectives

During this reporting periods emphasis was given to completing and following the code through the V2 Code delivery sequence, refining the land product phase-in plan, refining the product validation plans, planning the MODIS validation activity in southern Africa, coordinating the EOS Land Validation Program, reviewing the fire burn scar algorithm, refining the MODLAND production reduction plan, developing new schedules around the impending launch slip and developing the MODLAND QA activity.

We continued to build the collaboration required to conduct the work of developing community consensus algorithms on Fire, Surface Reflectance and Vegetation Indices. The project has developed a number of collaborative activities that are intended to expand the scope of the team members' activities and involve a larger community in MODIS research. Chris Justice participated the Discipline Leaders meetings and whenever possible the weekly Technical Team (TT) Meetings. Dr. Vermote represents the land group at the TT Meetings in Dr. Justice's absence.

In addition, the goals of the MODIS project, the status of the instrument and preliminary results of the research were presented at scientific meetings. Results of the studies undertaken as part of the project are in the process of being written up and submitted for publication. Considerable time was spent in coordinating and soliciting contributions to the MODLAND IGARS omnibus paper and the JGRS fire review paper. Publications are listed below.

In agreement with the MODIS Project Scientist, resources from this project continue to support the surface reflectance product. This includes providing shared support for personnel and computer resources with Dr. E. Vermote. A fuller account of this supporting activity performed by P.Fisher is outlined in the companion report of Dr. Vermote.

b) Tasks Accomplished (Data analysis and interpretation)

Version 2 Software (L.Giglio and P. Fisher)

Emphasis in this quarter was given towards backstopping the Vegetation Index code developed at University of Arizona and refining the surfcae felectance and fire code.

Two bugs were fixed in the MODIS 250m L3 VI algorithm code and new code was deliveredto MODIS SDST. The first bug involved the correct reading of the HDF-EOS metadata, as the code read the metadata incorrectly. The second bug did not allow the algorithm to process properly when run on 16 days of data. A bug in the HDF-EOS metadata was fixed in the MODIS L3 gridded fire detection algorithm code. A patch was delivered to MODIS SDST. A major patch was developed for the MODIS L2 surface reflectance algorithm code. Delivered this patch to MODIS SDST. The V 2.1 delivery of the MODIS L3 gridded surface reflectance product was delivered to the MODIS Science Data Support Team. The MODIS V2.0 1Km L3 vegetation index algorithm to SDST was delivered. The MODIS Level 2 surface reflectance code was chaperoned at the DAAC processing system. P. Fisher worked with Robert Wolfe (RSTX/Code 922) to specify exactly which MODIS tiles will be utilized for land global processing and began working on integrating the at-launch land cover product into the MODIS L2 surface reflectance algorithm. Some problems were noted with the product format, which was passed on to the individual devleopers. P. Fisher worked with MODIS SDST to change the ECS system design for the MODIS 1km L3 vegetation index algorithm. The earlier system design was left over from V1 code and was completely inefficient for running the V2 algorithm. The ODL production rules were developed for the MODIS L2 surface reflectance algorithm at the request of SDST.

In doing this work, major deficiencies in the ECS specified production rules were noted which must be rectified in order to correctly run the code. These deficiencies were passed on to SDST and GDAAC. P. Fisher worked with Paul Shehadi (MODIS SDST/GSC/Code 922) on developing methods that may improve the code delivery process to the MODIS Science Data Support Team and, ultimately, to the DAACs. P.

Fisher aided the Boston SCF in developing code to produce HDF-EOS output. Runtime system problem were traced down a on our SGIs (w/ Louis Giglio SSAI/Code 923). Worked with the MODIS TLCF support staff to have the appropriate OS patches installed on the system.

Error message/operator action lists were created for the MODIS L2 surface reflectance product and the MOD14 L3 gridded fire detection product. Collaboration was developed with Kamel Didan, the new programmer hired by the University of Arizona MODIS Science Computing Facility. Kamel will be at Goddard for approximately one month. During this time P. Fisher instructed/trained him in how the MODIS Vegetation Index code has been put together. This enabled him to handle all future code maintenence and new code development for the MODIS Vegetation Index algorithms working from the University of Arizona.

Paul Fisher
-- Attended SCF organizational meeting. Reworked the meeting notes taken by B. Kannenburg(MAST) for C. Justice.
-- Aided development of the MODIS Land production management group.
-- Attended and reviewed the MEBS demo.
-- Attended ECS V0 ordering tool demo (which we thought was going to be a B0SOT demo).

MODIS Fire Detection (w. L. Giglio, P. Fisher, Y. Kaufman and J. Kendall)

Louis Giglio assisted P. Fisher (SSAI) during numerous debugging sessions of the MODIS surface reflectance and fire product code. Thirty validation sites were selected for evaluation of MODIS fire algorithm and products. Sites were selected on the basis of: 1) regions in which major fire activity is expected, 2) areas in which the detection algorithm is likely to experience problems, particularly false detections (based on our simulation results and experience with AVHRR), and 3) excluding areas within those MODIS production tiles (i.e. 75% of all tiles) that will not be produced the first year after launch.

A fire product test plan was drafted addressing algorithm (science) testing, code implementation testing, and code exception and error handling. A preliminary fire product quality assurance (QA) plan was developed, including a list of potential product-specific QA tools (software) and useful ancillary databases.

Louis Giglio attended :

- the MODLAND SDST meeting 11-13 February 1998. Presented preliminary fire product validation and QA plans.
- four MOD09/14 Science Computing Facility (SCF) meetings concerning current status, testing plans, and completion schedules for the MODIS surface reflectance and fire product software.

EOS Validation (Chris Justice and Bob Swap)

Much of this last quarter has involved preparation for MODIS validation activities in Southern Africa. The preparation has included submission of workshop proposal to NSF international programs for a Land-Atmosphere-Biosphere Interaction workshop that will focus on formulation and consensus concerning a regional science initiative that will rely heavily upon existing funded MODIS validation activities (e.g. SAVE). Regional participants will be invited so as to be exposed to the science behind the NASA EOS-AM1 platform instruments as well as to proper observation and instrumentation techniques involved with MODIS validation efforts on the ground and in the air.

A southern African coordination meeting of funded NASA EOS validation activities is also scheduled. I am involved with the planning of the meeting, agenda and participant list. The meeting is scheduled to take place in the Goddard area on June 29-30, 1998.

Progress has also been made on the securing of funds to buy equipment for validation. Bids have begun to be taken and early orders placed so that much of this equipment will be ready for deployment by mid to late July of this year.

Prototyping will be done on the AVHRR data record for 1997, using data from the Zibbee Experiment.

Progress has also been made in the area of early MODIS science. An outline has been formulated with Dr. Eric Vermote (UMD) that deals with a prototype of an Aerosol Optical Thickness (AOT) product overland that will be compared to existing ground truthing observations. Work has begun on the preparation of a manuscript that will deal qualitatively with this early prototypical AOT product.

Science Computing Facility

Networking ATM Switch

In cooperation with Sanjay Taneja ,code 540, configuration of ATM interface cards and switches were installed to ensure internal and external ATM OC3 communication.

An ATM connection was established and configured in Bldg. 28 allowing proper communication between all the SCF components.

Digital AlphaServer

The operating system was upgraded along with its dependencies from version 3.2 to 4.0D. I ATM OC3 networking capabilities were installed and configured.

Auspex NetServer

Full configuration of the NFS server including its ATM interface was completed . In cooperation, with Keenan Bayol with Auspex, system updates were made adding Very Large Files (>2 Gbytes) support.

Storage

The Hierarchical System Management software Omnistorage 2.20 was configured. Reliability, performance, and functionality tests were undertaken. Utilities improving omnistorage manageability were developed. Basic maintenance and system administration including kernel tunes, system patches and updates were provided.

By adding to an the existing Ethernet 10BaseT, an ATM OC3 network interconnecting all the processing systems, the SCF is now provided with a strong, fast and reliable network. It is fundamental especially since the SCF is based on a distributed processing strategy. The existing 10BaseT network will continue to be used for communication with Xterminals and as a backup in case of an ATM Failure.

Liaison

Justice represented the MODIS Land program at the Landsat 7 Science Team Meeting to coordinate Landsat Acquisition for MODIS Validation and atmospheric correction of Landsat 7 using MODIS data.

Justice presented the MODIS Fire Product plans at the IGBP DIS Fire Algorithm Working group meeting in Toulouse.

Justice presented the MODIS Land products at the NASA LCLUC Science Team meeting in March.

New Publications

Kaufman, Y.J., C.O. Justice, L.P. Flynn, J.Kendall, E. Prins, D.E. Ward, A. Setzer, Monitoring Global Fires from EOS-MODIS, IEEE EOS AM Special Edition - submitted

Giglio, L., J. Kendall and C.O. Justice, Evaluation of Global Fire Detection Algorithms Using Simulated AVHRR Data, IJRS Submitted.

Justice C.O. et al MODIS land products : at launch status - TGARS AM Special Edition - submitted

New Staff

None